

2013

M.Sc.

3rd Semester Examination

ZOOLOGY

PAPER—ZOO-301

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—A

(Microbiology)

1. Answer any two questions of the following : 2×2
- (a) State the Ecological importance of Algae.
 - (b) What is the difference between synthetic and complex media ?
 - (c) What is lyophilization ?
 - (d) What is the purpose of 'Catalase test' ?

(Turn Over)

2. Answer any *two* questions of the following : 4×2
- (a) Why *E. Coli* is considered as indicator of water pollution? What are coliforms? 3+1
 - (b) Describe the criteria upon which colonies of bacteria can be identified? Add a note on the Pour-plate culture technique. 2+2
 - (c) What are accessory growth factors? Define Capnophilic bacteria. 2+2
 - (d) Draw and describe different parts of a bacterial flagella. 2+2
3. Answer *one* question of the following : 8×1
- (a) (i) Draw and label the ultrastructure of a Gram negative bacterial cell wall.
 - (ii) What is the relation between bacteria and geosmin? 4+4
 - (b) (i) Draw and explain the phases of bacterial growth curve.
 - (ii) Illustrate the 8-kingdom classification system. 4+4

Group—B**(Bio-Instrumentation)**

4. Answer any *two* questions of the following : 2×2
- (a) State the biological significance of gel-filtration.
 - (b) Briefly describe the role of secondary electron in scanning electron microscope (SEM).
 - (c) What is dichromatic error ?
 - (d) Name two stains used in TEM.
5. Answer any *two* questions of the following : 4×2
- (a) (i) State the principle of confocal microscopy.
(ii) Name the stains used in fluorescence microscopy. 2+2
 - (b) Briefly describe the 'ion-exchange chromatography' with the help of a suitable example. 4
 - (c) How do you obtain the Crystal structure in your laboratory using the X-ray? State its significance in biological sciences. 3+1
 - (d) Distinguish between (any *two*) : 2×2
 - (i) TEM and SEM.
 - (ii) Adsorption chromatography and partition chromatography.
 - (iii) α -spin and β -spin.

6. Answer one from the following : 8×1

(a) Write the principle of Gel-Electrophoresis. Discuss briefly the steps of Agarose Gel Electrophoresis. Write the composition of tracking dye used in Agarose gel Electrophoresis. 2+5+1

(b) Write short notes on (any *four*) of the following : 2×4

- (i) IMAC-Technique.
 - (ii) Soft X-ray and Hard X-ray.
 - (iii) Principles of NMR.
 - (iv) AFM-Niddle.
 - (v) Density gradient centrifugation.
 - (vi) Vascular perfusion technique.
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